LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES

OFFICE OF FISHERIES
INLAND FISHERIES SECTION

PART VI -B

WATERBODY MANAGEMENT PLAN SERIES

SPANISH LAKE

WATERBODY EVALUATION &
RECOMMENDATIONS

CHRONOLOGY

DOCUMENT SCHEDULED TO BE UPDATED ANNUALLY

May 7, 2006 - Prepared by
Mike Walker, Biologist Manager, District 9

June 26, 2008 – Updated by
Mike Walker, Biologist Manager, District 9

August 2013 – Updated by
Jody David, Biologist Manager, District 6

TABLE OF CONTENTS

WATERBODY EVALUATION

STRATEGY STATEMENT

Recreational
Proposed management recommendations are designed to provide sustained recreational fishing.

Commercial
Proposed management recommendations will not initially include a commercial fishing component.

Species of special concern
No threatened or endangered species have been observed in Spanish Lake.

EXISTING HARVEST REGULATIONS

Recreational
Statewide regulations for all fish species; the 2013 recreational fishing regulations may be viewed at the link below: http://www.wlf.louisiana.gov/regulations

Commercial
Commercial fishing activities are prohibited

Species of Special Concern
No threatened or endangered fish species are found in this water body.

SPECIES EVALUATION

Recreational

Largemouth Bass

Relative abundance-
Bass up to 10 pounds have been captured over the years of sampling with electrofishing and gill nets (Figure 1). However, LDWF sampling catch per unit effort (CPUE) for largemouth bass has decreased dramatically over time, likely due to the reduced habitat quality. Production for largemouth bass and forage species (sunfishes) has been negatively influenced as turbidity and algal blooms have exacerbated over time.

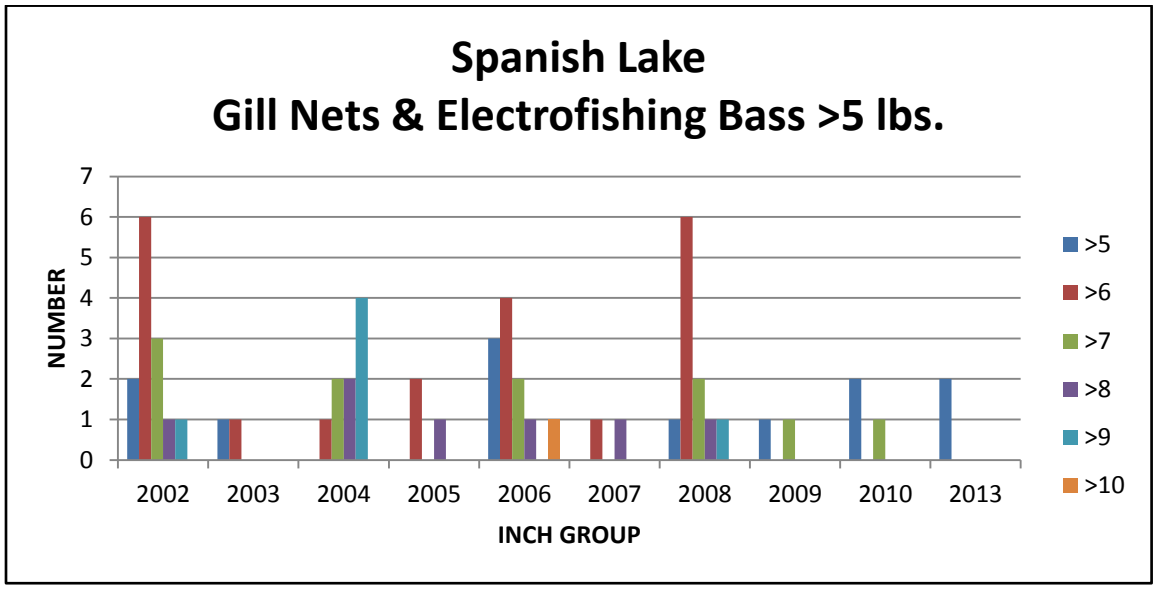

Figure 1. The number of largemouth bass five (5) pounds or greater collected during gill net and electrofishing sampling efforts on Spanish Lake, LA, from years 2002 – 2013.

Largemouth bass (LMB) abundance reached a peak in 1998 following the renovation of 1997. LDWF sampling reflected the abundance with an electrofishing CPUE of 120 bass per hour. Unfortunately, the situation was short-lived and all post-1999 sampling includes CPUE < 20 bass per hour (Figure 2). With minor exception, LMB have been absent in LDWF sampling efforts since 2010.

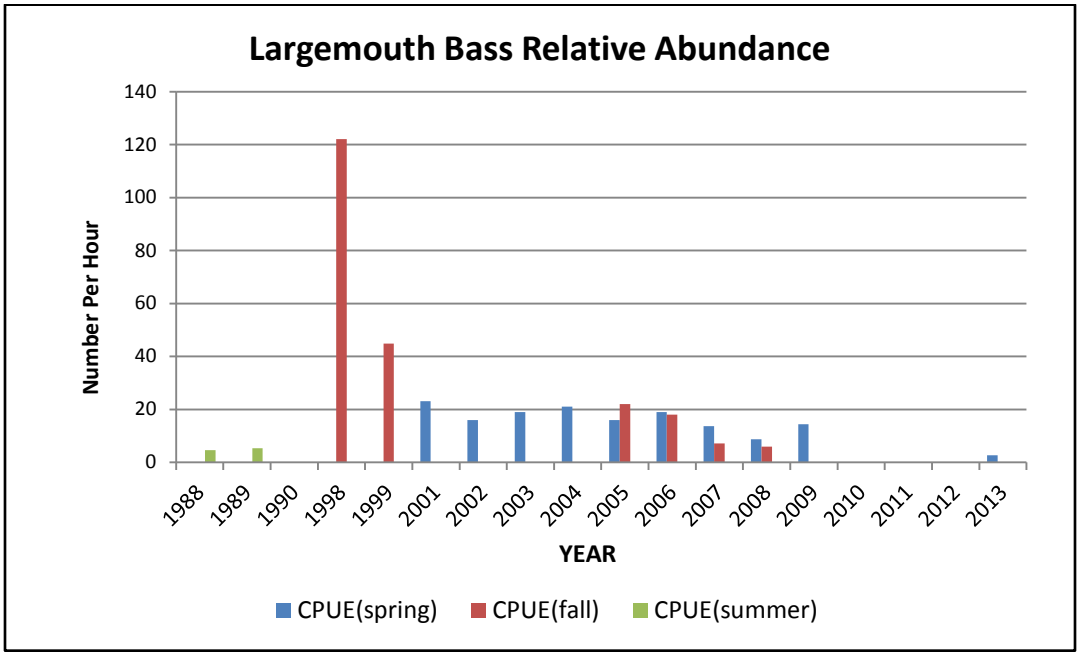

Figure 2. The CPUE (number per hour) for largemouth bass during spring, fall and summer electrofishing sample efforts at Spanish Lake, LA, from the years 1988-2013.

Abundance of LMB bass less than eight inches total length (TL) has been low over the last two decades (Figure 3). A large increase in the young-of-the-year (YOY) and age 1 LMB in the 1998 sampling efforts was likely due to habitat improvements that occurred during the drawdown of 1996-1997.

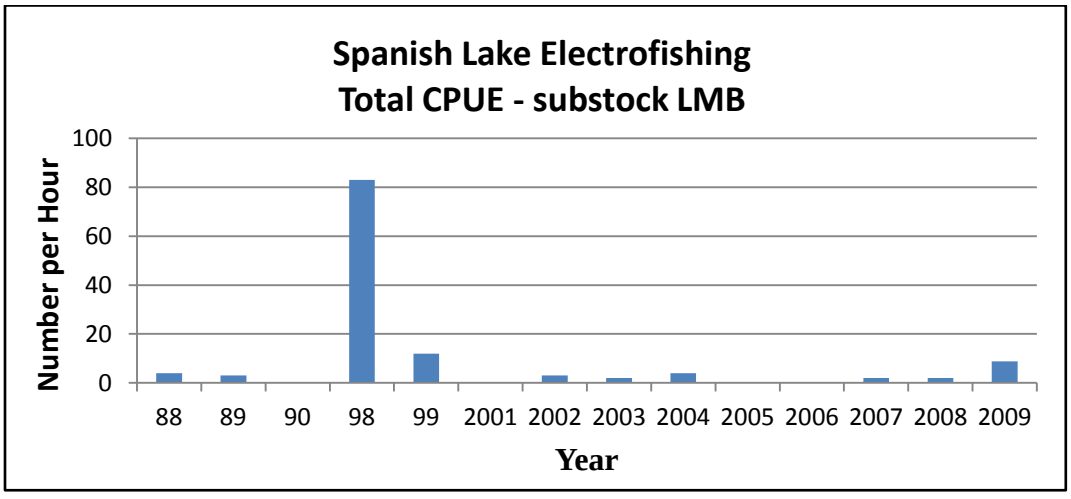

Figure 3. Electrofishing CPUE for largemouth bass of sub-stock size (< 8") for Spanish Lake, Louisiana, for the years 1988-2009.

Largemouth Bass Genetics-

The majority of Spanish Lake largemouth bass collected for genetic determination was collected during fall standardized electrofishing sampling. Total length and weight is recorded for each specimen, otoliths (ear bones) and liver tissue are removed for growth and

genetic analysis. Liver tissue is analyzed at the Louisiana State University genetics laboratory with starch gel electrophoresis. As indicated in Table 1, the percentage of Spanish Lake largemouth bass population with the Florida bass (FLMB) genome increased steadily through 2007. However, FLMB introductions were discontinued after 2006 when the presence of LMB populations all but disappeared (Figure 2). The measured increase of the Florida genetic influence in Spanish Lake could be initially perceived as a positive management result. Unfortunately, the increased presence of stocked fish is more likely an indicator of failed natural reproduction due to habitat impairment.

Table 1. Largemouth bass stockings and genetic analyses results for Spanish Lake, LA, 1998 – 2007.

GENETICS/STOCKING OF LARGEMOUTH BASS						
Year	FLMB Stockings	Sample Size	Northern	Florida	Hybrid	Florida Influence
1998	54,033	59	79%	7%	14%	21%
1999	99,252	7	72%	14%	14%	28%
2000	129,716					
2001	125,266	51	55%	29%	16%	45%
2002	125,898					
2003	135,552					
2004	125,676	7	72%	14%	14%	28%
2006	12,810	27	45%	22%	33%	55%
2007		9	11%	45%	44%	89%

Forage

Forage fish are abundant in Spanish Lake. Electrofishing CPUE for bluegill, redear sunfish, warmouth, green sunfish and longear sunfish is presented in Figure 5. Sunfish are primarily located in the immediate vicinity of the rip rap along the ring levee. The open waters of Spanish Lake are teeming with threadfin and gizzard shad of all size classes. Threadfin shad were the dominant species as shown in Figure 6 rotenone results from 2005 and 2007.

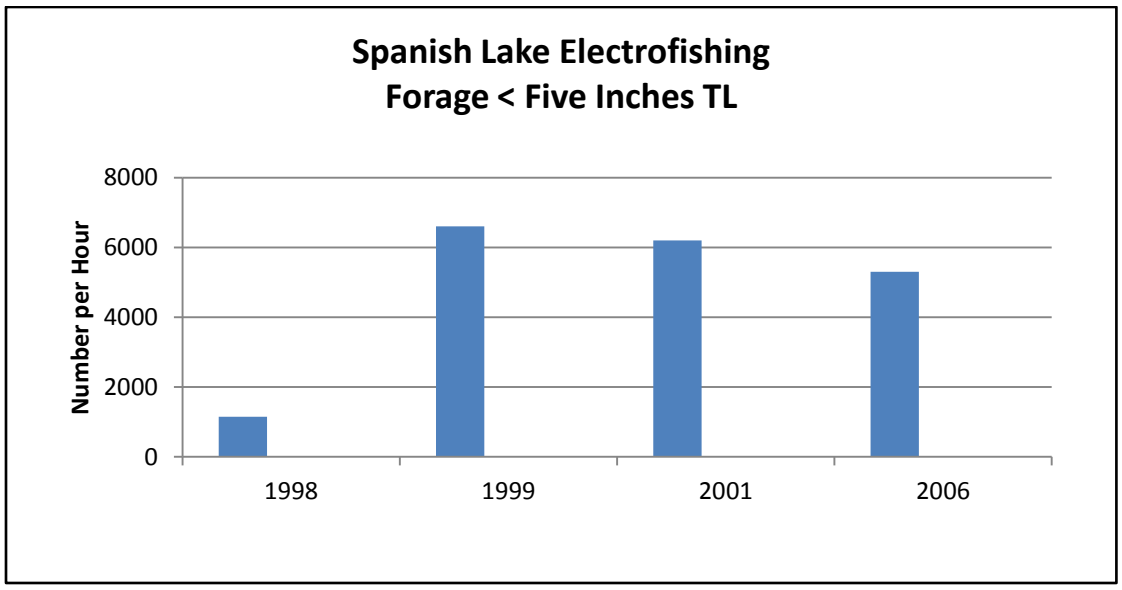

Figure 5. The CPUE for forage fishes < five inches in TL collected in fall electrofishing samples in Spanish Lake, Louisiana from 1998 – 2006.

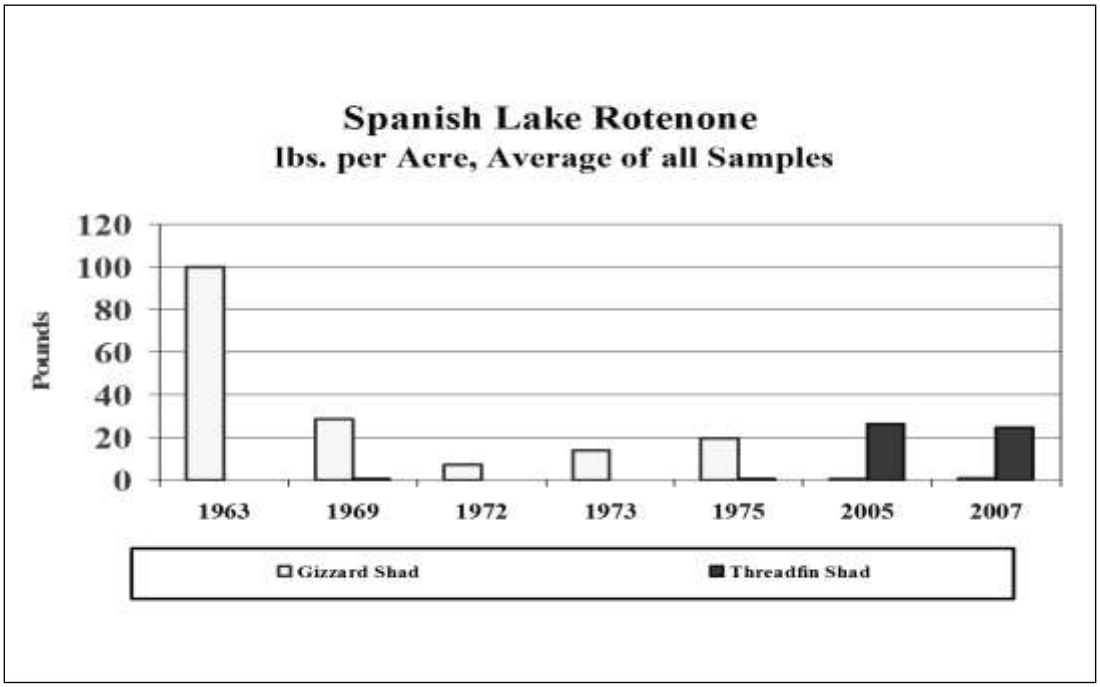

Figure 6. The pounds per acre of shad from biomass (rotenone) sampling on Spanish Lake, Louisiana conducted from 1963-2007.

Crappie

Similar patterns of abundance to largemouth bass have been found for crappie in Spanish Lake. Crappies have become absent in LDWF sampling efforts. In Figures 7, 8 and 9 below the trend of CPUE for crappie captured by electrofishing and gill nets in the lake over time is

shown. Sub-stock or young-of-the-year (YOY) crappie numbers have greatly diminished from sampling efforts along with adults.

The crappie population initially responded very well to the Spanish Lake drawdown of 1997. A high CPUE for small crappie was documented following the event. A tremendous harvest of crappie was observed in the 4 years following refill. Samples from 1999 to 2001 indicate a significant reduction in crappie. Since 2005, few crappies have been observed in sampling efforts.

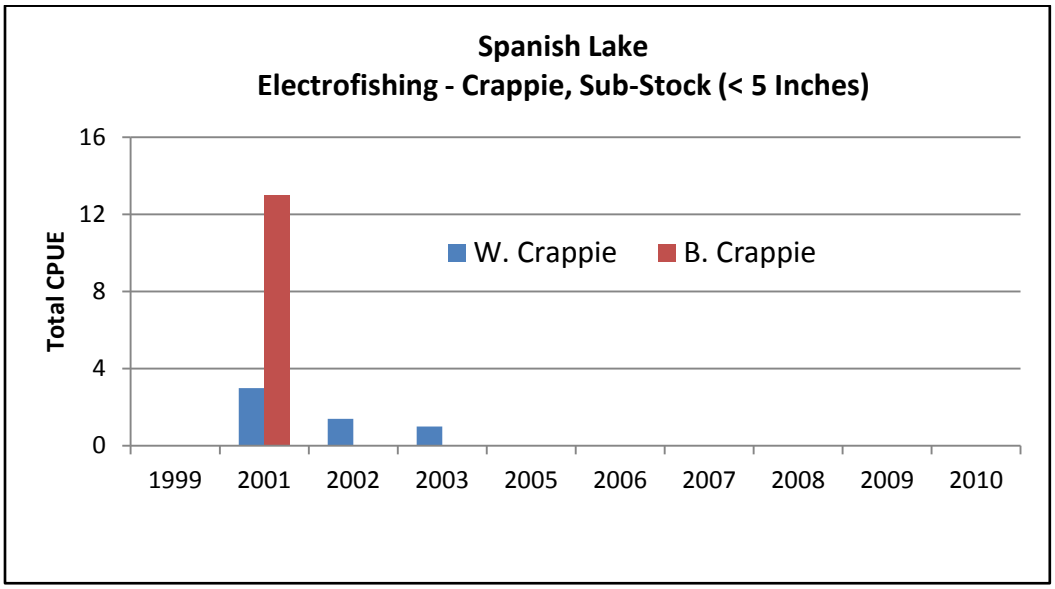

Figure 7. The CPUE for sub-stock size crappies (≤ five inches TL) collected during electrofishing sampling in Spanish Lake, Louisiana from 1999 – 2010.

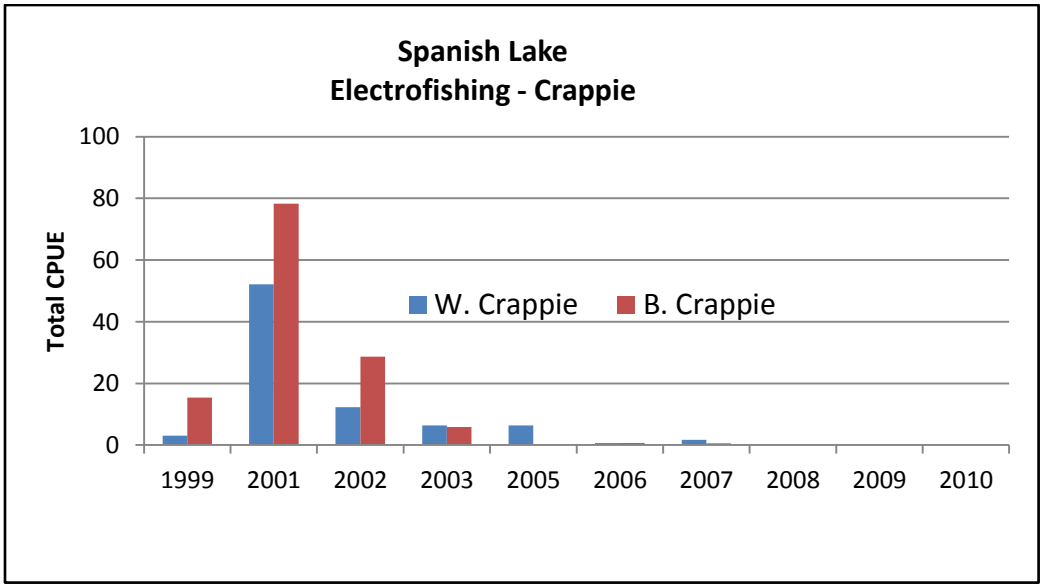

Figure 8. The CPUE (number per hour) for black and white crappies of all size classes sampled by electrofishing on Spanish Lake, Louisiana, for the years 1999-2010.

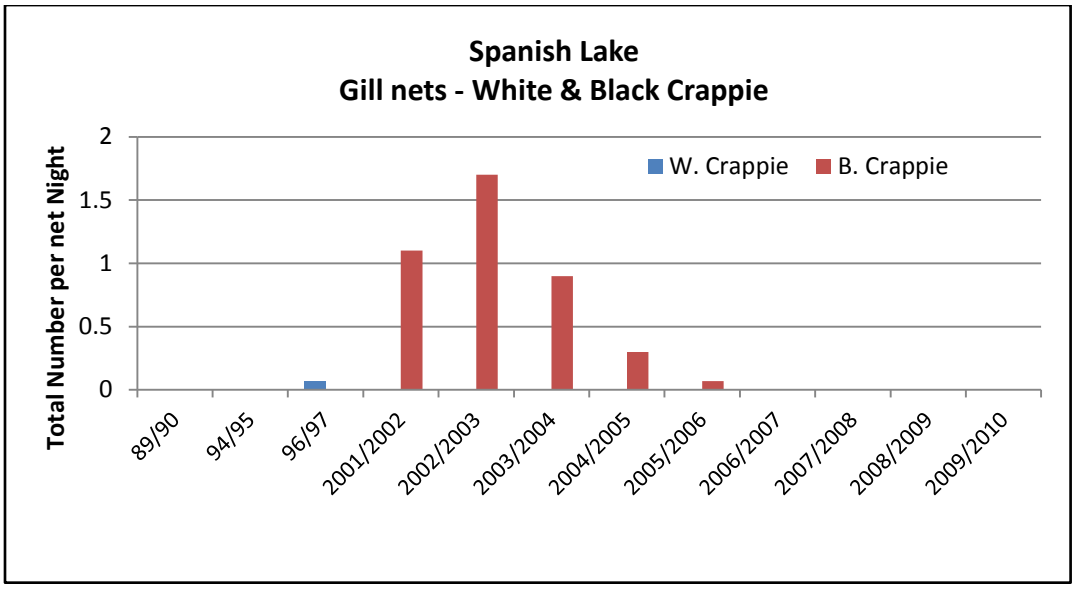

Figure 9. The CPUE for crappie sampled by gill nets at Spanish Lake, Louisiana, for the years 1989-2010.

Channel catfish

Spanish Lake supports an abundant catfish population. Biomass sampling from 2005 and 2007 (Table 2) indicates that blue catfish and channel catfish are some of the dominant recreational fish species found in the lake.

Table 2. Number and pounds of species collected during rotenone samples for Spanish Lake, Louisiana for 2005 and 2007.

Species	Site 1				Site 2			
	2005		2007		2005		2007	
	No.	Lbs.	No.	Lbs.	No.	Lbs.	No.	Lbs.
Yellow Bass	2	0.3	36	5.7	24	1.6	35	1.9
White Crappie			2	3.3				
Bluegill			1	0.1				
Redear Sunfish					10	0.0		
Longear Sunfish			2	0.0	13	0.0		
Warmouth			1	0.0				
Freshwater Drum	27	27.9	77	57.8	9	10.9	35	19.8
Yellow Bullhead			20	1.4				
Channel Catfish	62	21.6	653	112.6	82	30.2	112	24.6
Blue Catfish	42	25.6			52	22.6	7	10.8

Commercial

The historical record shows only one permit to harvest rough fish issued. It was issued by the Spanish Lake Game and Fish Preserve Commission before regulatory authority was placed under the Louisiana Wildlife and Fisheries Commission. No related harvest records were found.

It is unlikely that commercial harvest would have the desired effect of significantly reducing the common carp and buffalo populations. Literature and past experience indicate that removing larger, older specimens from these populations is likely to induce a spawn to replace the harvested fish. Anecdotal evidence suggests that in the winter of 2007/2008 a commercial fisherman inadvertently caught over 3,000 pounds of common carp and buffalo while illegally fishing hoop nets in Spanish Lake.

In Figure 3 below, common carp abundance has remained high as indicated in gill net catches over the past 15 years. Note that the abundance increased dramatically following the drawdown of the mid 1990's.

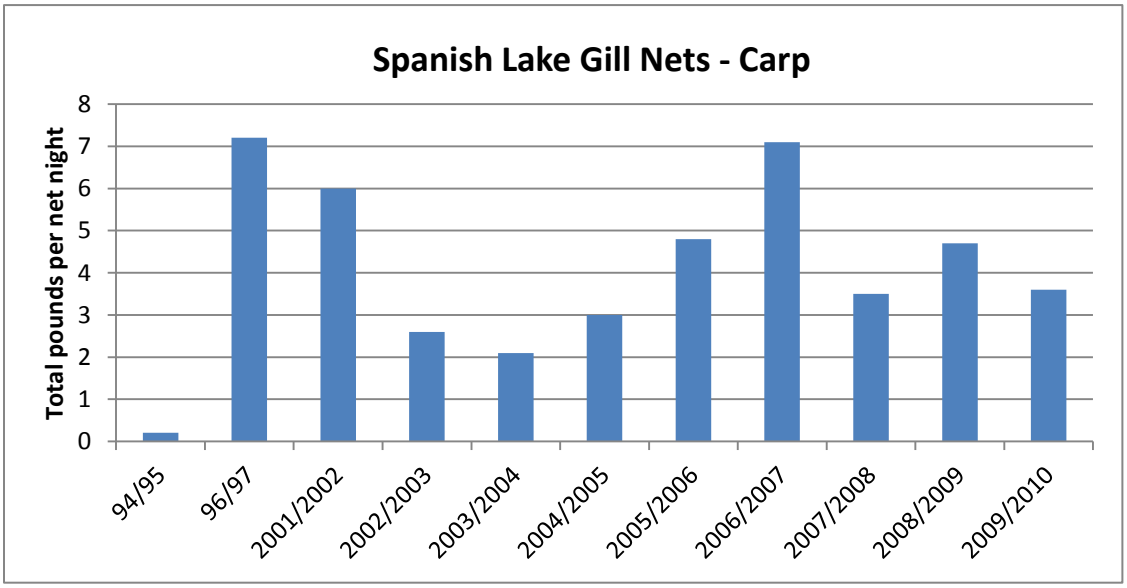

Figure 3. The total pounds per net night of common carp from gill net samples taken on Spanish Lake, Louisiana from 1994/1995 – 2009/2010.

Species of Special Concern

No threatened, endangered or species of special concern have been found in the lake.

HABITAT EVALUATION

Aquatic Vegetation

The most current type map from 2011 shows the lake had no submerged aquatic vegetation. (SEE MP-A, APPENDIX II)

The only aquatic vegetation present in this lake as of summer 2013 is a growing patch of American lotus (*Nelumbo lutea*). It has been expanding in the shallow areas of the lake. Control options will be considered only when lotus coverage nears the 20 – 30% areal

displacement. Phytoplankton populations in Spanish Lake are dense and are a significant contributor to overall turbidity. The average turbidity for Spanish Lake is 21.88 centimeters (8.6 inches) of transparency as measured with a Secchi disk (Figure 10).

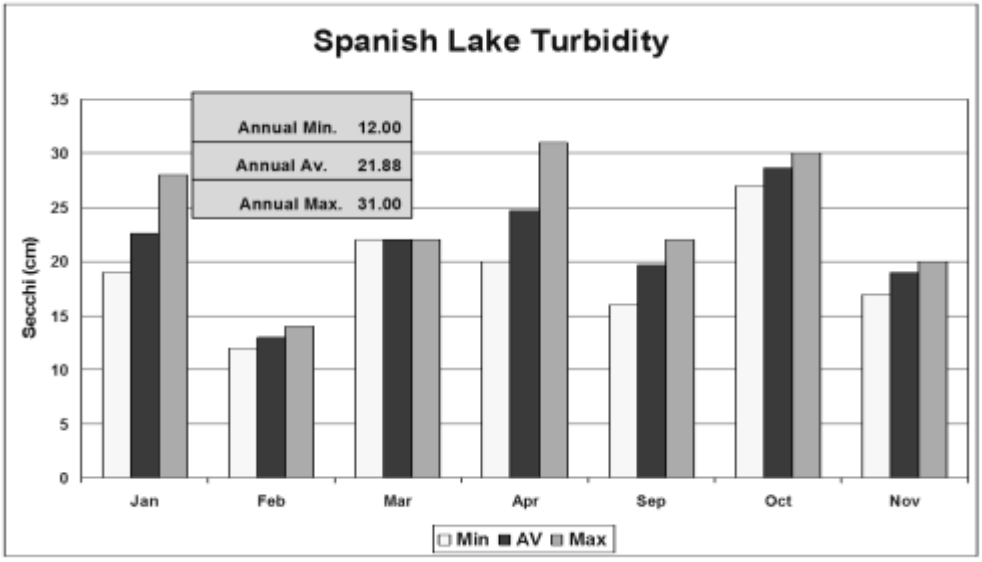

Figure 10. Secchi disk transparency (total turbidity) in centimeters below the surface for Spanish Lake, LA.

Spanish Lake continues to support heavy phytoplankton blooms throughout much of the calendar year. The combination of phytoplankton turbidity and inorganic turbidity precludes macrophyte growth. Overall, the Spanish Lake is free of submerged aquatic vegetation. Moderate amounts of American lotus (*Nelumbo lutea*) were observed in two locations along the breakwater levees. A small amount of water hyacinth (*Eichhornia crassipes*) was observed in the boat landing access channel. Emersed plant species observed along the shoreline include alligator weed (*Alternanthera philoxeroides*), maidencane (*Panicum hemitomon*), water primrose (*Ludwigia peploides*), duck potato (*Sagittaria latifolia*), Roseau cane (*Phragmites australis*), and cattail (*Typha latifolia*).

Substrate

The bottom of Spanish Lake is covered with soft organic material that is not a suitable spawning substrate for nesting fish. This material covers the entire bottom of the lake and varies in thickness from 1 foot to 17 feet. Below this soft organic material is a hard clay bottom that varies in depth below the waterline from 4 feet to 17 feet. This organic material contributes a high nutrient load that produces dense plankton "bloom" in the water column. The soft sediment provides generous foraging areas for common carp and buffalofish.

Artificial Structure

In 2006, seventy-eight plastic reef structures were built by LDWF personnel and placed in the lake. The structures were placed over an area of approximately 1 acre. The area was marked by buoys at four corners. Coordinates for the reef are 30.059626 N, -91.864273 W.

As an evaluation of fish use, two separate biomass (rotenone) samples were conducted. Preliminary evaluation of the reef site was conducted in 2005. Two follow-up biomass

samples were conducted in 2007 at the same sites. A 953% increase in channel catfish abundance was measured after reef construction. An increase of 37% was measured at the control site. The comparison demonstrates the potential for attraction of channel catfish to artificial structure in a formerly open water habitat.

Threadfin shad were in high abundance at both sites for both years. The reef site ranged from 10,512 per acre to 14,137 per acre at the reef site and from 12,452 to 4,925 per acre at the control site. Removing shad from the equation, it is apparent that more pounds of fish were present at the reef site with the greatest contributor being channel catfish. Small blue catfish were at both sites in 2005 with only a few remaining at the non-reef site in 2007. With the exception of channel catfish, freshwater drum and threadfin shad, little difference in fish species composition or abundance was measured between the reef site and the control site.

CONDITION IMBALANCE / PROBLEM

The lake bottom is covered with an excessive layer of soft organic material. The organics have resulted in excessive algal blooms and water quality impairment. Additionally, the soft "fluff" substrate prevents the successful reproduction of nesting fish by smothering nests and eggs.

The high volume of soft organic sediment is a significant factor in the impairment of Spanish Lake. Removal of these sediments could decrease the available nutrient load and uncover a more suitable substrate for aquatic plant growth and fish spawning. Unfortunately, removal of the material is cost prohibitive.

Common carp are well suited to the habitat conditions of Spanish Lake and are overabundant to the extent that they interfere with the ability of sport fish populations to sustain. Physical activity of the carp population promotes increased water turbidity and impedes sport fish nesting. The feeding activity (rooting) of the carp on the lake bottoms also serves to inhibit growth of submerged vegetation.

The cumulative factors noted above have led to severe habitat impairment in Spanish Lake. These impairments have caused a shift in the fish community away from the desirable fish species such as largemouth bass, crappie and sunfish, now being replaced with more turbidity tolerant species such as catfish, carp, buffalofish and shad.

CORRECTIVE ACTION NEEDED

The current fish community is dominated by undesirable species that can sustain and even thrive in the existing conditions. Drawdowns and rotenone applications are an efficient means of removing unwanted fish populations from lakes, but those tools may not be appropriate for Spanish Lake. But due to the limited watershed size, the refilling of Spanish Lake could take up to 4 years. Such a scenario would be unpopular with the local community. As an alternative, actions necessary to address overabundant populations of carp and buffalo could be accomplished through the application of commercial fishing. Currently, the possession or use of commercial nets, including hoop nets, trammel nets, gill nets, and fish seines is illegal in Spanish Lake. A rule change through authority of the Louisiana

Wildlife and Fisheries Commission would be necessary.

RECOMMENDATIONS

1. Reduction of undesirable species such as common carp and buffalo (rough fish) is recommended. This can be accomplished by rescinding the existing prohibition of commercial gear for Spanish Lake and allowing anglers to harvest rough fish by legal commercial methods.

2. Stock species that are adapted to the existing habitat such as white crappie, catfish (blue, channel and flathead), hybrid stripers and alligator garfish. These species will be stocked three consecutive years starting in 2015 -2017 and be given a trial period of five years (2015 – 2020) to show overall improvement of a balanced fishery.

3. LDWF standardized sampling will continue to monitor fish population trends. If after an evaluation period of five years the fishery does not prove to be satisfactory, a complete renovation of Spanish Lake should be considered.

4. The 16–21 inch protected slot regulation for Spanish Lake LMB should be rescinded.

5. LDWF will share recommendations and status updates with the Spanish Lake State Game and Fishing Commission and any other interested public entity on a timely basis.